## CLAIMS

1. Weldable component of structural steel, characterized in that its chemical composition comprises, by weight:

$$0.40\% \leq C \leq 0.50\%$$
$$0.50\% \leq Si \leq 1.50\%$$
$$0\% \leq Mn \leq 3\%$$
$$0\% \leq Ni \leq 5\%$$
$$0\% \leq Cr \leq 4\%$$
$$0\% \leq Cu \leq 1\%$$
$$0\% \leq Mo + W/2 \leq 1.5\%$$
$$0.0005\% \leq B \leq 0.010\%$$
$$N \leq 0.025\%$$
$$Al \leq 0.9\%$$
$$Si + Al \leq 2.0\%$$

optionally at least one element selected from V, Nb, Ta, S and Ca, at contents of less than 0.3%, and/or from Ti and Zr at contents of less than or equal to 0.5%, the remainder being iron and impurities resulting from the production operation,

the contents of aluminium, boron, titanium and nitrogen, expressed in thousandths of %, of the composition also satisfying the following relationship:

$$B \geq \frac{1}{3} \times K + 0,5, \qquad (1)$$

with K = Min (I* ; J*)

$I^* = \text{Max}(0 ; I)$ and $J^* = \text{Max}(0 ; J)$

$$I = \text{Min}(N ; N - 0,29(Ti - 5))$$

$$J = \text{Min}\left(N ; 0,5\left(N - 0,52\ Al + \sqrt{(N - 0,52\,Al)^2 + 283}\right)\right),$$

and whose structure is bainitic, martensitic or martensitic-bainitic and also comprises from 3 to 20% of residual austenite.

2. Steel component according to claim 1, characterized in that its chemical composition also satisfies the following relationship:

$$1.1\%Mn + 0.7\%Ni + 0.6\%Cr + 1.5(\%Mo + \%W/2) \geq 1 \quad (2)$$

3. Steel component according to claim 2, characterized also in that its chemical composition satisfies the following relationship:

$$1.1\%Mn + 0.7\%Ni + 0.6\%Cr + 1.5(\%Mo + \%W/2) \geq 2 \quad (2)$$

4. Steel component according to any one of claims 1 to 3, characterized in that its chemical composition also satisfies the following relationship:

$$\%Cr + 3(\%Mo + \%W/2) \geq 1.8.$$

5. Steel component according to claim 4, characterized in that its chemical composition also satisfies the following relationship:.

$$\%Cr + 3(\%Mo + \%W/2) \geq 2.0.$$

6. Method for manufacturing a weldable steel component according to any one of claims 1 to 5, characterized in that

- the component is austenitized by heating at a temperature of from $Ac_3$ to 1000°C, and it is then cooled to a temperature of less than or equal to 200°C, in such a manner that, at the core of the component, the rate of cooling between 800°C and 500°C is greater than or equal to the critical bainitic velocity,

- optionally, tempering is effected at a temperature of less than or equal to $Ac_1$..

7. Method according to claim 6, characterized in that, at the core of the component, the cooling rate between 500°C and a temperature of less than or equal to 200°C is from 0.07°C/s to 5°C/s .

8. Method according to claim 6 or 7, characterized in that tempering is effected at a temperature of less than 300°C for a period of time of less than 10 hours, at the end of the cooling operation to a temperature of less than or equal to 200°C.

9. Method according to claim 6 or 7, characterized in that no tempering is carried out at the end of the cooling operation to a temperature of less than or equal to 200°C.

10. Method for manufacturing a weldable steel plate according to any one of claims 1 to 5, the thickness of which is from 3 mm to 150 mm, characterized in that the plate is quenched, the cooling rate $V_R$ at the core

of the component between 800°C and 500°C and the composition of the steel being such that:

$$1.1\%Mn + 0.7\%Ni + 0.6\%Cr + 1.5(\%Mo + \%W/2) + \log V_R \geq 5.5.$$

11. Method for manufacturing a weldable steel plate according to claim 10, the thickness of which is from 3 mm to 150 mm, characterized, in addition, in that the plate is quenched, the cooling rate $V_R$ at the core of the component between 800°C and 500°C and the composition of the steel being such that:

$$1.1\%Mn + 0.7\%Ni + 0.6\%Cr + 1.5(\%Mo + \%W/2) + \log V_R \geq 6.$$